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AUTHOR Metzl, Marilyn Newman
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ABSTRACT

A study was undertaken on the effects of a specific parent administered infant language stimulation program, beginning at birth, on the longitudinal development of 60 normal first born infants. All infants and their environments were tested in their homes at 6 weeks and at 6 months utilizing the Bayley Scales of Infant Development and the HOME Inventory. The Ss were divided into three groups (control, mothers receiving the program, and both mothers and fathers receiving the program). All groups showed an increase in the Bayley Mental Standard Scores, with infants whose parents both received training exhibiting the greatest gain over time. HOME scores, which measured the adequacy of the home environment, showed a training effect improvement, but the two groups did not differ significantly from each other. It was concluded that the program may benefit all children, and that parents of first born children would benefit from preparation and assistance in helping their child achieve maximum potential. (Author/PHR)

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# Teaching Parents a Strategy for Enhancing Infant Development

Marilyn Newman Metzl, Ph.D.

Menorah Medical Center

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Abstract

Sixty normal first-born children of two-parent, private service families comprised the subject pool for this study. All infants and environments were tested in their homes at six weeks and six months, utilizing the Bayley Scales of Infant Development and the HOME inventory. Subjects were divided into three groups at birth: control, mothers receiving a specific language stimulation program, and mothers and fathers receiving the program simultaneously.

The control group and both treatment groups showed an increase in Bayley Mental Standard Scores, with infants whose parents received simultaneous training exhibiting the greatest gain over time. Home scores, measuring the adequacy of the home environment also showed a training effect but experimental groups did not differ significantly from each other. The implication of this study is that the high-risk intervention strategies of Heber (1973) and Levenstein (1970) may benefit all children, regardless of income level, and that parents of first-born children would benefit from preparation and assistance in helping their child achieve at maximum potential.

# Teaching Parents a Strategy for Enhancing Infant Development

A current view of infant development holds that infants are not merely passive recipients of environmental stimulation, but active processors of complex stimulus materials in their environment (Bell, 1974). Watslawick (1967) in describing interactions, has said that it is impossible for two persons confronting each other not to interact, and that it is possible to discuss positive interactions or negative interactions between two people, but never of no interaction. An extension of this hypothesis was studied by Brazelton (1974), who set up interactive experiments between parents, objects and infants to see if infants were capable of differentiating between familiar faces and objects at an early age. Brazelton found that there were two distinct patterns of infant response to an object versus a familiar person as early as one week of age; the infants showed significantly greater attention, awareness and response to the familiar person. He concluded that there is an intrauterine preconditioning to human stimuli, and that the reactions of infants to "mothering cues" set off complex reactions in the infant that might best be described as a readiness for reciprocal

interaction.

Historically, emphasis has been placed on the effects of the physical and social milieu on the developing child. However, recent research in infant cognition (Lozoff, 1977) has shown that the view of the infant as a passive recipient of environmental stimulation is an understatement of the infant's potential as an active participant in human interactions. Even the size and facial characteristics of the infant may be capable of evoking social interaction from an approaching adult. The implications of this revised "view" of development is that infants should benefit from early, intensive experiences that provide verbal and environmental stimulation. Since the child's experiences and the caregiver's experiences can no longer be viewed as mutually exclusive, the later development of mental and motor skills in the infant can be viewed as an ecosystem of parent-child interactions. These interactions have their genesis in the pre-natal stage of development, and grow druing the post-natal period.

## Adult Impact as a Source of Language Learning

Traditionally, parents in our society provide a majority of the caregiving activities. Therefore, stimuli eminating from the parents acquire a special value for the child. Lewis (1977) has recently suggested that "it may be the case

that all relationships in which significant learning takes place are characterized by information exchange within a socio-economic context."

Of interest to language researchers has been the work of Schacter (1977) focusing on the differences in the kinds of language directed to toddlers by disadvantaged compared with advantaged black and white mothers. Although no race differences were found, marked social class differences did exist. Advantaged mothers spoke to their children twice as much and gave three times as much responsive talk to their toddlers. Disadvantaged mothers often ignored a child's initiatives, and used don't about once in every four utterances, compared with the advantaged mothers' using "don't" once in every twelve utterances. The speech of advantaged mothers was found to be more relevant to the child's vocalizations and needs. Brown (1971) found that middle-class parents expanded about 30 percent of their children's statements, lower-class parents do so far less often.

Most research programs have been involving direct intervention designed to study the effects of intervention on children at risk due to biological, emotional or environmental factors. Few studies have examined the effects of providing parent education and emotional support for families of children not raised in poverty. The assumption is that

those that "have enough" will "get enough." Yet, middle-class families not living in poverty may need education for parenting and infant stimulation. Aaronson (1975) cited evidence that middle-class families often have problems that affect the successful progress of their children through the academic system and into the adult world.

The primary purpose of the present study was to investigate the effects of a specific parent administered infant language stimulation program beginning at birth on the longitudinal development of normal middle-class first born infants (Metzl, 1977).

The major questions of interest were: a) Does presentations of the Infant Language presented to groups of mothers and mothers and fathers influence their infants mental and motor behavior at six months? b) Does the presentation of the Infant Language Program result in changes in the environment in middle class families? The answers to these questions should illuminate the relationship between the traditional concept of membership in the middle class as sufficient for optimal growth and development of the infant.

## Method

### Subjects--Parents

With the cooperation of the medical and nursery staff of four private hospitals, letters informing primiparous mothers of the study were distributed one day post-partum. Seventy-five percent of the eligible families contacted agreed to participate in the project, representing a total of sixty families. Criteria for selection were that families be married, two-parent families, self-supporting (no welfare patients), with both parents having at least a high school education. Most (85 percent) of the fathers had professional or managerial occupations.

### Subjects--Infants

The selection criteria for infants were that they be a first-born child, with a normal prenatal and postnatal history: normal pregnancy of more than thirty-seven weeks gestation. All infants had to weigh more than 5 pounds 8 ounces at birth, and were required to have a recorded Apgar score of 7 or more at one minute, and 8 or more at 5 minutes. Birth was to be uneventful, as was postnatal recovery and nursing experiences. Groups were divided equally into ten male and ten female infants. Group assignment was randomized utilizing RANCAL, a computer-generated table of random numbers.

## Stimuli

The training materials used in this study were developed by Metzl (1977). They consisted of a training packet developed to promote infant development by highlighting caregiving activities and natural occurrences in child development and linking them to the development of reciprocal awareness between parent and child. The materials targeted naturally occurring situations and attempted to sensitize the parent or parents to the potential for interaction inherent in the daily routine. Training consisted of three one and one-half hour visits when the infants were 6, 12, and 18 weeks of age, and consisting of discussion of the training packet, modeling by the research assistant, and discussion of norms of infant development. A weekly data collection sheet was given to each parent, to serve as a daily reminder as well as to validate compliance.

## Procedure

The subject pool of sixty subjects was then randomly assigned to one of three groups:

Group 1 -- Control (20 families)

Group 2 -- Mothers only receiving training in the Infant Language Program (20 families)

Group 3 -- Mothers and fathers receiving the Infant Program simultaneously (20 families)

All infants were pretested individually at six weeks in their homes with the Bayley Scales of Infant Development: Mental, Motor and Social Scales. All home environments were assessed at six weeks with the Caldwell HOME inventory to obtain a measurement of the adequacy of the home environment. Twenty infants and parents, serving as the control group, received only testing of six weeks and six months. Twenty infants and mothers only received pre and posttesting and the Infant Language Program, and twenty mothers and fathers simultaneously received pre and posttesting and the program.

Infants and home environments were again measured at six months, and a comparison was made of test scores for treated and untreated infants and environments.

Two graduate research assistants administered all testing and training procedures. The testing was totally independent of the intervention , and all experimental subjects were instructed not to indicate to the tester that they had received the Infant Language Program.

## Reliability

Prior to initiation of the project, the tester participated in reliability measures with an independent observer and the principal investigator culminating in a reliability measure of .94 on the six week and six month tests.

The project trainer received two months of extensive training in administration of the Infant Language Program resulting in .90 reliability with the principal investigator on live and tape-recorded administrations.

## Results

The primary experimental questions were to test for group training effects in terms of test scores. Since the group assignment was appropriately randomized and the test scores were computed in interval data, the statistical design was a standardized analysis of variance (ANOVA) utilizing F ratios from an hierarchical model.

An analysis of the pretest responses of infants and parents indicated no differences between the three groups.

The mean scores for each group and pretest are shown in Table 1.

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Insert Table 1 about here

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### Effects of Training

Infants in both training conditions improved more on mental scores from pretest to posttest than children in the control condition ($F\ 2,57) = 4.83$, $p < .025$, indicating an effect of the training procedure on infant development. The beneficial effect of training was greater when the training was received by mothers and fathers simultaneously,

t (1.3) = 4.38, $p < .001$, than by mothers alone (t 1,2 = 2.68, $p < .025$). The variance of 6 months Bayley motor scaled (Standard) scores was not significant $F(2,57) = 1.17$, N.S.

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Insert Table 2 about here

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Environments

Environments in both training conditions improved more from pretest to posttest on HOME scores than environments of infants in the control conditions $F(2,57) = 4.46$, $p < .025$.

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Insert Table 3 about here

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Interpretation of these results indicated that both treatment groups were higher in average Home scores than the control group, but did not differ significantly from each other. $t(1,2) = 4.08$, $p < .001$, $t(1,3) = 2.92$, $p < .01$, $t(2,3) = 1.17$ N.S.

## Discussion

In terms of Bayley and HOME performance, infants who participated in the training aspect of this study showed a beneficial effect of teaching middle class parents a strategy for enhancing infant development. The effect of a specific language program, initiated by groups of mothers, and

mothers and fathers when their first born child was six weeks old resulted in improved performance on Bayley Mental Standard scores when the infants were six months old. Gain was noted between both experimental groups and the control group. The group in which the mother and father were trained simultaneously achieved higher mean scores than the group in which the mother alone received training. HOME scores also showed a training effect, with the greatest difference appearing between the control group and either treatment group. In contrast to other studies in which significant training results were achieved through intervention in a high-risk environment (Weikart, 1970; Gordon, 1971). This study demonstrated the potential for gain through intervention in a middle-class environment. Morecver, the trend shown here is similar to that reported by Karnes (1970) and Levenstein (1970), who reported an I.Q. gain of 16 points for disdavantaged infants 12-24 months, over the matched control group following enviornmental intervention.

In discussing the training effect on infant Bayley Mental Scores, no longitudinal conclusions can be drawn without follow-up data through at least the first five years of life. However, the fact that the infants who received additional input from both parents achieved the highest scores when compared to the traditional view of parents

meaning "mothers," appears to indicate that the requirement that the father be involved in a home stimulation program is mandatory. Studies that investigate the influence of the mother only in middle class families where a father is present may yield artificial results because of the untested influence that the father was also involved.

One can hypothesize that, by assisting parents to recognize the infant's early potential for interaction, and providing them with techniques for generating and responding to subtle early communications, they become responsive to the mutual transmission of messages. Parents in the experimental groups reported feeling reinforced by the effects of their interactions with their infants. The involvement of the fathers resulting in increased infant scores would confirm the work of Allison Clark-Stewart (cited in Honig 1977) who found that the higher the child's intelligence at 15 months, the more likely it was that daddy would play with the baby at 30 months. The chain of interaction was presumed to be that the more alert and responsive the baby, the more the father became interested in interaction.

The effects of a specific training program on parents merits discussion. Since all subjects enrolled in this project provided environments falling in the fifth stanine prior to treatment, it can be assumed that according to

ranking (Caldwell, 1968) all environments were "adequate" prior to treatment. Conceivably, this parent population requires minimal instruction to generalize suggestions from the Infant Language Program and translate them into action. The fact that the program resulted in improved environments for the experimental groups when compared to the control group is significant, indicating that change is possible in a population that has traditionally been presumed to be providing maximum stimulation by virtue of socioeconomic status.

The present findings address themselves to the question of whether or not infant intervention can increase competence. As the family remains the primary educational system for most infants, with their parents acting as their primary teachers, it appears that all families, regardless of income level, would benefit from preparation and assistance in helping their child achieve the best possible beginning in life.

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Table 1

Comparison of Bayley Mental Standard Score Data (6 week) and Caldwell Data (6 week)

| | Mean | Median | S.D. |
|---|---|---|---|
| Bayley | | | |
| Group 1 | 95.85 | 96 | .939362 |
| Group 2 | 95.45 | 96 | 1.132440 |
| Group 3 | 95.95 | 96 | .882192 |
| Caldwell (HOME) | | | |
| Group 1 | 35.45 | 35 | .624853 |
| Group 2 | 36.35 | 37 | .872083 |
| Group 3 | 36.70 | 37 | .645031 |

Table 2

Analyses of Variance of 6-Month Standa d Scores on the Mental and Motor Scales of the Bayley Scales of Infant Development

| | Mental Scale | | | | | Motor Scale | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Source | df | SS | MS | F | | df | SS | MS | F | |
| Group | 2 | 565.3 | 282.6 | 4.83 | p .025 | 2 | 720.6 | 360.3 | 1.17 | N.S. |
| Error | 57 | 3336.9 | 58.54 | | | 57 | 17,548.5 | 307.9 | | |

Table 3

Analysis of Variance of 6 Month Responses

Caldwell Observation for Measurement

of the Environment (HOME)

| Source | df | SS | MS | F |
|---|---|---|---|---|
| Group | 2 | 84.0 | 42.0 | 4.46* |
| Error | 57 | 536.9 | 9.42 | |

*p < .025